

Appl. No. 09/675,220  
Amendment dated:  
Reply to OA of: May 6, 2004

### **REMARKS**

A non-final Office Action was mailed May 6, 2004. Claims 1-11, 15-17 and 22-27 were pending. By the foregoing, claims 1-5, 11, 15-17 and 22-27 are cancelled, and claims 6-10 are amended.

Applicants gratefully acknowledge the Examiner's withdrawal of the rejections made in the prior Office Action. Applicants earnestly wish to bring the present case to allowance and the present response is intended to do so.

Therein, applicants have carefully reviewed the Examiner's Office Action, in which the Examiner rejected claims 1-10, 15-17 and 22-27 under 35 U.S.C. 103(a) as being unpatentable over Anderson et al. (U.S. Patent 6,064,799), while claim 11 is rejected under 3 U.S.C. 103(a) as being unpatentable over Anderson et al. '799 in view of Halpin et al. (U.S. Patent 6,113,702).

#### **Amendments to the Claims**

Applicants have amended the claims in order to more particularly define the invention taking into consideration the outstanding Official Action.

Claims 1-5, 11, 15-17 and 22-27 have been canceled from further prosecution.

Claims 6-10 have been amended to overcome 35 U.S.C. 103(a) rejections. All of the amendments are fully supported by the original disclosure of this application and therefore do not constitute the introduction of any new matter into this case.

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Rejection under 35 U.S.C. 103(a) over Anderson et al. (US 6,064,799)

The rejections of claims 6-10 under 35 U.S.C. 103(a) as being unpatentable over Anderson et al. (US 6,064,799) has been carefully considered but is respectfully traversed.

Applicants wish to direct the Examiner's attention to the basic requirements of a prima facie case of obviousness as set forth in the MPEP §2143. This section states that to establish a prima facie case of obviousness, three basic criteria first must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine the reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.

The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure. *In re Vaack*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Further, MPEP §2143.03 states that all claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). "All words in a claim must be considered in judging the patentability of that claim against the prior art." *In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970).

This rejection is respectfully traversed on the grounds that a prima facie case of obviousness of the amended claims is not been established.

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In particular, the present invention, as defined in the amended claim 6, is directed to a method for controlling temperatures in a semiconductor manufacturing apparatus, wherein a temperature controlling step is carried out by using a P (proportional), an I (integral) and a D (derivative) operation outputs and power ratios corresponding to a given temperature, and a power ratio multiplied by the I operation output is different from a power ratio multiplied by the P and D operation output as described in page 22, lines 6-8 of the present specification.

Further, as shown in claim 7, a controlled power output for a heating source may be determined by multiplying a power ratio only by the I operation output.

Although Anderson mentions a PID control method as being conventional, the control method disclosed in the present invention as shown in claims 6 and 7 are neither disclosed nor implied in the prior art. Moreover, with reference to specification and Fig. 7 of the present invention, it is clear that the control method shown in claims 6 and 7 provides better reproducibility, i.e., less deviation between repeated executions, in comparison with a PID power ratio control when an external disturbance, e.g., due to a wafer loading occurs. Anderson cannot provide such reproducibility because it employs only PID control method.

Moreover, as shown in claim 8, a controlled power output for a heating source may be determined by multiplying the P, the D and the I operation outputs by a power ratio during processing a wafer (i.e. PID control method) and is determined by multiplying the power ratio only by the I operation output when loading a wafer into the reaction chamber (i.e. PD-I control method).

By employing this method, a reliable and reproducible temperature control can be accomplished as described in specification and Fig. 7 of the present

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invention.

Since the prior art does not disclose nor imply the control method of multiplying the power ratio only by the I operation output as describe above, it could not be obvious to employ a PID control method when there is no external disturbance and employ the above PD-I control method if otherwise.

In addition, as stated in claim 9, the present invention discloses a method for controlling temperatures in a semiconductor manufacturing apparatus, comprising a step of controlling a given temperature by performing power control on heating sources based on at least one set of power ratios, wherein said at least one set of power ratios is selected by using a target temperature.

By using the target temperature instead of a measured temperature, an improved temperature reproducibility can be obtained in case of the presence of an external disturbance as described in specification and Fig. 8 of the present invention.

In contrary, Anderson involves only measured temperatures in calibration steps for producing look-up tables as shown in column 5, lines 42-46 of the specification. In short, Anderson does not disclose nor imply to use a target temperature to select sets of power ratios, therefore cannot establish a basis to reject the present invention.

Furthermore, as shown in claim 10, said at least one set of power ratios may be selected by using a target temperature when loading a wafer into the reaction chamber and is selected by using a measured temperature during processing a wafer.

With reference to specification and Fig. 8 of the present invention, it is clear that an improved temperature reproducibility, a faster temperature response and an

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improved temperature stability can be obtained by employing the above selection method.

But, as described above, Anderson does not disclose nor imply to use a target temperature to select sets of power ratios, and consequently same to the above selection method stated in claim 10.

Therefore, the prior art does not contain the necessary motivation to modify the reference to arrive at the claimed invention, absent Applicants' teaching. In re Fritch, 23, USPQ 1780, 1784 (Fed. Cir. 1992) ("It is impermissible to engage in hindsight reconstruction of the claimed invention, using the applicant's structure as a template and selecting elements from references to fill the gaps.").

As stated above, the prior art references do not show the inventive features of the present invention as set forth in the amended claims 6-10. Accordingly, it is most respectfully submitted that the amended claims 6-10 define patentable inventions over the prior art references, including Anderson; and is, therefore, allowable.

All dependent claims are allowable for at least the same reasons as those for the independent claim from which they depend.

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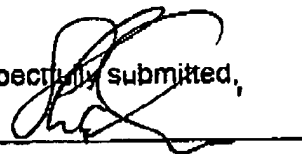
### CONCLUSION

Applicants believe that this is a full and complete response to the Office Action. For the reasons discussed above, applicants now respectfully submit that all of the pending claims are in complete condition for allowance. Accordingly, it is respectfully requested that the Examiner's rejections be withdrawn; and that claims 6-10 be allowed in their present forms. If the Examiner feels that any issues that remain require discussion, he is kindly invited to contact applicant's undersigned attorney to resolve the issues.

In view of the above comments and further amendments to the claims, favorable reconsideration and allowance of all of the claims now present in the application are most respectfully requested.

However, if for any reason the Examiner should consider this application not to be in condition for allowance, the Examiner is respectfully requested to telephone the undersigned attorney at the number listed below prior to issuing a further Action. Any fee due with this paper may be charged on Deposit Account 50-1290.

Respectfully submitted,



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